Invoice

Moffatt & Nichol P.O. Box 22648 Long Beach, CA 90801-5648 Phone: (562) 590-6500

Robert Law April 27, 2012

De Maximis Inc. 60545 Invoice No:

Engineer/Scientist II Mathew, Rooni

Staff Engineer/Scientist

5 · ·	0004					
Project Professional Ser	6664 vices from F	Lower Passaic River Resto February 26, 2012 to March 31, 2012	Lower Passaic River Restoration Modeling Work - Initial Tasks			
Phase		4 LPR/NB RI/FS Modeling Program	 TOM4			
Task	08	Developing LPR/NB Modeling TOM		and Budget		
Professional Per		Beveloping Entertained and Fermi	0011, 00.1044.0	and Dauget		
		Hours	Rate	Amount		
Engineer/Scientis	t III			7		
Canizares, Ra		8.00	185.00	1,480.00		
Engineer/Scientis						
Mathew, Roon	I	2.00	164.00	328.00		
Totals Total Labor		10.00		1,808.00	1,808.00	
TOTAL CADOL					•	
			Total	this Task	\$1,808.00	
			Total th	is Phase	\$1,808.00	
Additional Tasks	`	12 HD Model RM109				
Task Professional Per	connol	12 HD Wodel RW109				
Professional Per	Some	Harma	Dete	A		
Engineer/Scientis	+ 111	Hours	Rate	Amount		
Canizares, Rat		8.00	185.00	1,480.00		
Support Staff Eng		5.55	100.00	1, 100.00		
Manian, Dines		30.00	90.00	2,700.00		
Totals		38.00		4,180.00		
Total Labor					4,180.00	
			Total	this Task	\$4,180.00	
			Total Addition	nal Tasks	\$4,180.00	
- 		5 LPR/NB RI/FS Modeling Program				
Task	01		101110			
। ask Professional Per		Project Management				
		Hours	Rate	Amount		
Engineer/Scientis Canizares, Rat		64.00	185.00	11,840.00		
Canizares, Rai Totals	iaci	64.00	103.00	11,840.00		
Total Labor		04.00		11,040.00	11,840.00	
			Total	this Task	\$11,840.00	
					Ψ11,040.00	
Task	02	Data Analysis & Monitoring Design	Coordination for U	se In Numberical Mo	del	
Professional Per	sonnel					
		Hours	Rate	Amount		
Engineer/Scientis						
Canizares, Rat		24.00	185.00	4,440.00		

10.50

164.00

1,722.00

\cappa_{\chi} \chi_{\chi}			444.00	0.400.00	
Xiong, Yi Support Staff Engineer		80.00	114.00	9,120.00	
Manian, Dinesh otals		10.00 24.50	90.00	900.00 16,182.00	
otal Labor	Į	24.50		10, 102.00	16,182.00
			Total t	his Task	\$16,182.00
	System Understanding				
rofessional Personnel		•	D - 4 -	A	
ngineer/Scientist III	ľ	Hours	Rate	Amount	
Canizares, Rafael ngineer/Scientist II		26.50	185.00	4,902.50	
Mathew, Rooni upport Staff Engineer		12.00	164.00	1,968.00	
Manian, Dinesh		02.00	90.00	9,180.00	
otals otal Labor	1	40.50		16,050.50	16,050.50
otal Edwor			Total ti	his Task	\$16,050.50
ask 04 rofessional Personnel	LPR/NB Hydrodynamic Mode	eling		_	
	ŀ	Hours	Rate	Amount	
ngineer/Scientist III Canizares, Rafael		12.50	185.00	2,312.50	
otals otal Labor		12.50		2,312.50	2,312.50
otal Labol			Total t	his Task	\$2,312.50
					φ2,312.30
ask 05	LPR/NB Sediment Transport	Modeling			
rofessional Personnel		Hours	Rate	Amount	
ngineer/Scientist III	·				
Canizares, Rafael ngineer/Scientist II		3.50	185.00	647.50	
Mathew, Rooni upport Staff Engineer		85.00	164.00	13,940.00	
Manian, Dinesh		56.00	90.00	5,040.00	
otals otal Labor	1	44.50		19,627.50	19,627.50
			Total t	his Task	\$19,627.50
ask 07 rofessional Personnel	LPR/NB Contaiminant Fate a	nd Trans	port Modeling		
	H	Hours	Rate	Amount	
ngineer/Scientist III Canizares, Rafael		15.00	185.00	2,775.00	
ingineer/Scientist II Mathew, Rooni		60.50	164.00	9,922.00	
otals		75.50		12,697.00	40.00= 00
otal Labor			T-4-1 4	hio Took	12,697.00
			ı otal t	his Task	\$12,697.00
ask 10	Computer Support				
rofessional Personnel	,	مريم	Doto	A no a 4	
ngineer/Scientist II	,	Hours	Rate	Amount	
Mathew, Rooni otals		6.00 6.00	164.00	984.00 984.00	
otals otal Labor		0.00		904.00	984.00
			Total t	his Task	\$984.00

Total this Phase

\$79,693.50

Please remit payment of this invoice to:

Moffatt & Nichol ABA #121000248 Account #4159349729 Swift #WFBIUS6WFFX Wells Fargo Bank 111 W. Ocean Blvd., Suite 300 Long Beach, CA 90802 USA

Project	6664	Lower Passaic Rive	r Restoration		Invoice	60545
	g Backup ^{& Nichol}	Inv	oice 60545 Dat	ed 4/27/2012		
Project	6664	Lower Passai	c River Restora	tion Modeling We	ork - Initial Tasks	
hase		4 LPR/NB RI/FS Model			on - milar rasks	
Γask Profossio	08 nal Personnel	Developing LPR/NB N	lodeling 10ivi3	SOVV, Schedule	and Budget	
10162210	nai Personnei		Hours	Rate	Amount	
Engineer/S	Scientist III		Hours	Nuc	Amount	
548	Canizares, Rafael	3/3/2012	8.00	185.00	1,480.00	
:ngineer/s !219	Scientist II Mathew, Rooni	3/3/2012	2.00	164.00	328.00	
otals	,		10.00		1,808.00	
Total Labo	or					1,808.0
				Total ti	nis Task	\$1,808.0
				Total thi	s Phase	\$1,808.0
 Additional	 I Tasks					
— — — - Гаѕк	01	HD Model RM109				
Profession	nal Personnel					
			Hours	Rate	Amount	
	Scientist III	2/2/2042	0.00	405.00	4 400 00	
1548 Support St	Canizares, Rafael taff Engineer	3/3/2012	8.00	185.00	1,480.00	
2301	Manian, Dinesh	3/3/2012	22.00	90.00	1,980.00	
2301	Manian, Dinesh	3/10/2012	8.00	90.00	720.00	
Γotals Γ otal Lab o	or		38.00		4,180.00	4,180.0
				Total t	his Task	\$4,180.0
				Total Addition	al Tacke	\$4,180.0
				Total Addition	ai rasks	ψ4,100.0
hase		5 LPR/NB RI/FS Model	ing Program T	OM5		
ask	01	Project Management		. – – – – –		
Profession	nal Personnel	, 0				
			Hours	Rate	Amount	
-	Scientist III	0/0/0040		405.00		
1548 1548	Canizares, Rafael Canizares, Rafael	3/3/2012 3/10/2012	8.00 8.00	185.00 185.00	1,480.00 1,480.00	
548	Canizares, Rafael	3/10/2012	1.50	185.00	277.50	
1548	Canizares, Rafael	3/10/2012	1.50	185.00	277.50	
1548 1548	Canizares, Rafael	3/10/2012	5.00	185.00 185.00	925.00 1.665.00	
	Canizares, Rafael Canizares, Rafael	3/17/2012 3/24/2012	9.00 4.00	185.00	1,665.00 740.00	
1548	Canizares, Rafael	3/24/2012	8.00	185.00	1,480.00	
1548		3/24/2012 3/24/2012	4.00	185.00	740.00	
1548 1548	Canizares, Rafael		4.00	185.00	740.00	
1548 1548 1548 1548 1548	Canizares, Rafael		11 00	185 00	2 035 00	
1548 1548	,	3/31/2012	11.00 64.00	185.00	2,035.00 11,840.00	
548 548 548 548	Canizares, Rafael Canizares, Rafael			185.00		11,840.0

			Hours	Rate	Amount	
Engineer/S	cientist III					
1548	Canizares, Rafael	3/3/2012	8.00	185.00	1,480.00	
1548	Canizares, Rafael	3/10/2012	8.00	185.00	1,480.00	
1548	Canizares, Rafael	3/31/2012	2.00	185.00	370.00	
1548	Canizares, Rafael	3/31/2012	6.00	185.00	1,110.00	
Engineer/S	cientist II					
2219	Mathew, Rooni	3/3/2012	3.00	164.00	492.00	
2219	Mathew, Rooni	3/3/2012	1.00	164.00	164.00	
2219	Mathew, Rooni	3/3/2012	2.00	164.00	328.00	
2219	Mathew, Rooni	3/10/2012	3.00	164.00	492.00	
2219	Mathew, Rooni	3/31/2012	1.50	164.00	246.00	
	eer/Scientist	0/04/0040	40.00	444.00	4 00 4 00	
2403	Xiong, Yi	3/24/2012	16.00	114.00	1,824.00	
2403	Xiong, Yi	3/24/2012	8.00	114.00	912.00	
2403	Xiong, Yi	3/24/2012	8.00	114.00	912.00	
2403	Xiong, Yi	3/24/2012	8.00	114.00	912.00	
2403 2403	Xiong, Yi	3/31/2012	8.00 8.00	114.00 114.00	912.00	
	Xiong, Yi	3/31/2012			912.00 912.00	
2403 2403	Xiong, Yi	3/31/2012 3/31/2012	8.00 8.00	114.00 114.00	912.00	
2403	Xiong, Yi Xiong, Yi	3/31/2012	8.00	114.00	912.00	
	aff Engineer	3/31/2012	8.00	114.00	912.00	
2301	Manian, Dinesh	3/3/2012	10.00	90.00	900.00	
Totals	Maman, Dinesii	3/3/2012	124.50	90.00	16,182.00	
Total Labo	\ P		124.50		10, 102.00	16,182.00
TOTAL LABO	,					
				Total t	this Task	\$16,182.00
Task	03	System Understanding				
Profession	nal Personnel					
			Hours	Rate	Amount	
Engineer/S	cientist III			· tate	711104111	
1548	Canizares, Rafael	3/10/2012	1.00	185.00	185.00	
1548	Canizares, Rafael	3/10/2012		185.00	647.50	
1548 1548	Canizares, Rafael Canizares, Rafael	3/10/2012 3/17/2012	3.50	185.00 185.00	647.50 2.960.00	
1548 1548 1548	Canizares, Rafael Canizares, Rafael Canizares, Rafael	3/10/2012 3/17/2012 3/24/2012		185.00 185.00 185.00	647.50 2,960.00 740.00	
1548	Canizares, Rafael	3/17/2012	3.50 16.00	185.00	2,960.00	
1548 1548	Canizares, Rafael Canizares, Rafael Canizares, Rafael	3/17/2012 3/24/2012	3.50 16.00 4.00	185.00 185.00	2,960.00 740.00	
1548 1548 1548	Canizares, Rafael Canizares, Rafael Canizares, Rafael	3/17/2012 3/24/2012	3.50 16.00 4.00	185.00 185.00	2,960.00 740.00	
1548 1548 1548 Engineer/S	Canizares, Rafael Canizares, Rafael Canizares, Rafael cientist II	3/17/2012 3/24/2012 3/31/2012	3.50 16.00 4.00 2.00	185.00 185.00 185.00	2,960.00 740.00 370.00	
1548 1548 1548 Engineer/S 2219	Canizares, Rafael Canizares, Rafael Canizares, Rafael cientist II Mathew, Rooni	3/17/2012 3/24/2012 3/31/2012 3/3/2012	3.50 16.00 4.00 2.00	185.00 185.00 185.00 164.00	2,960.00 740.00 370.00 1,640.00	
1548 1548 1548 Engineer/S 2219 2219 2219	Canizares, Rafael Canizares, Rafael Canizares, Rafael cientist II Mathew, Rooni Mathew, Rooni	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00	185.00 185.00 185.00 164.00	2,960.00 740.00 370.00 1,640.00 164.00	
1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Cientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00	185.00 185.00 185.00 164.00 164.00 164.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00	
1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Cientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012 3/10/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00 8.00 8.00	185.00 185.00 185.00 164.00 164.00 164.00 90.00 90.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00 720.00	
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1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301 2301 2301 2301 2301 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Cientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/17/2012 3/24/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00 8.00 8.00 8.00 8.00	185.00 185.00 185.00 164.00 164.00 90.00 90.00 90.00 90.00 90.00 90.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00 720.00 720.00 720.00 1,440.00 540.00	
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1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301 2301 2301 2301 2301 2301 2301 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Cicientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/17/2012 3/24/2012 3/24/2012 3/24/2012 3/3/2012 3/3/2012 3/3/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00 8.00 8.00 8.00 6.00 8.00 8.00 8.00 8	185.00 185.00 185.00 164.00 164.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00 720.00 720.00 720.00 540.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00	16,050.50
1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301 2301 2301 2301 2301 2301 2301 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Cicientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/17/2012 3/24/2012 3/24/2012 3/24/2012 3/3/2012 3/3/2012 3/3/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00 8.00 8.00 8.00 6.00 8.00 8.00 8.00 8	185.00 185.00 185.00 164.00 164.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00 720.00 720.00 720.00 1,440.00 540.00 720.00 720.00 720.00 720.00 720.00 720.00	16,050.50 \$16,050.50
1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301 2301 2301 2301 2301 2301 2301 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Cicientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/17/2012 3/24/2012 3/24/2012 3/24/2012 3/3/2012 3/3/2012 3/3/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00 8.00 8.00 8.00 6.00 8.00 8.00 8.00 8	185.00 185.00 185.00 164.00 164.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00 720.00 720.00 720.00 540.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00	
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1548 1548 1548 Engineer/S 2219 2219 2219 Support Sta 2301 2301 2301 2301 2301 2301 2301 2301	Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Cicientist II Mathew, Rooni Mathew, Rooni Mathew, Rooni aff Engineer Manian, Dinesh	3/17/2012 3/24/2012 3/31/2012 3/3/2012 3/24/2012 3/24/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/17/2012 3/24/2012 3/24/2012 3/24/2012 3/31/2012 3/31/2012 3/31/2012	3.50 16.00 4.00 2.00 10.00 1.00 1.00 8.00 8.00 8.00 6.00 8.00 8.00 8.00 8	185.00 185.00 185.00 164.00 164.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00 90.00	2,960.00 740.00 370.00 1,640.00 164.00 164.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00 720.00 1,440.00 720.00 720.00 1,440.00 16,050.50	
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Total Labor 2,312.50

Total this Task \$2,312.50

Task	05	LPR/NB Sediment Tra	ansport Modeling	g	—— —	- — -
Professio	nal Personnel					
			Hours	Rate	Amount	
	Scientist III					
1548	Canizares, Rafael	3/10/2012	2.50	185.00	462.50	
1548	Canizares, Rafael	3/31/2012	1.00	185.00	185.00	
Engineer/S 2219		3/3/2012	1.00	164.00	164.00	
2219	Mathew, Rooni Mathew, Rooni	3/3/2012	4.00	164.00	656.00	
2219	Mathew, Rooni	3/3/2012	8.00	164.00	1,312.00	
2219	Mathew, Rooni	3/10/2012	7.00	164.00	1,148.00	
2219	Mathew, Rooni	3/10/2012	3.00	164.00	492.00	
2219	Mathew, Rooni	3/10/2012	.50	164.00	82.00	
2219	Mathew, Rooni	3/10/2012	1.00	164.00	164.00	
2219	Mathew, Rooni	3/17/2012	6.00	164.00	984.00	
2219	Mathew, Rooni	3/17/2012	3.00	164.00	492.00	
2219	Mathew, Rooni	3/17/2012	4.00	164.00	656.00	
2219	Mathew, Rooni	3/17/2012	3.00	164.00	492.00	
2219	Mathew, Rooni	3/17/2012	5.00	164.00	820.00	
2219	Mathew, Rooni	3/24/2012	4.00	164.00	656.00	
2219	Mathew, Rooni	3/24/2012	4.00	164.00	656.00	
2219	Mathew, Rooni	3/24/2012	7.00	164.00	1,148.00	
2219	Mathew, Rooni	3/24/2012	4.00	164.00	656.00	
2219	Mathew, Rooni	3/31/2012	8.00	164.00	1,312.00	
2219 2219	Mathew, Rooni	3/31/2012 3/31/2012	5.00 7.50	164.00 164.00	820.00 1,230.00	
	Mathew, Rooni taff Engineer	3/31/2012	7.50	104.00	1,230.00	
2301	Manian, Dinesh	3/10/2012	8.00	90.00	720.00	
2301	Manian, Dinesh	3/17/2012	8.00	90.00	720.00	
2301	Manian, Dinesh	3/17/2012	8.00	90.00	720.00	
2301	Manian, Dinesh	3/17/2012	8.00	90.00	720.00	
2301	Manian, Dinesh	3/24/2012	8.00	90.00	720.00	
2301	Manian, Dinesh	3/24/2012	8.00	90.00	720.00	
2301 2301	Manian, Dinesh Manian, Dinesh	3/24/2012 3/31/2012	8.00 8.00	90.00 90.00	720.00 720.00	
	Manian, Dinesh Manian, Dinesh					
2301	Manian, Dinesh		8.00		720.00	19,627.50
2301 Totals	Manian, Dinesh		8.00	90.00	720.00	19,627.50 \$19,627.50
2301 Totals	Manian, Dinesh		8.00	90.00	720.00 19,627.50	
2301 Totals	Manian, Dinesh		8.00 144.50	90.00 Total	720.00 19,627.50	
2301 Totals Total Lab e	Manian, Dinesh or	3/31/2012	8.00 144.50	90.00 Total	720.00 19,627.50	
2301 Totals Total Labe Task Professio	Manian, Dinesh or 07 nal Personnel	3/31/2012	8.00 144.50	90.00 Total	720.00 19,627.50	
2301 Totals Total Labe Task Professio	Manian, Dinesh or 07 nal Personnel Scientist III	3/31/2012 LPR/NB Contaiminan	8.00 144.50 t Fate and Trans Hours	90.00 Total sport Modeling Rate	720.00 19,627.50 this Task ————————————————————————————————————	
2301 Totals Total Labe Task Professio Engineer/S	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael	3/31/2012 LPR/NB Contaiminan 3/17/2012	8.00 144.50 t Fate and Trans Hours 8.00	90.00 Total sport Modeling Rate 185.00	720.00 19,627.50 this Task ————————————————————————————————————	
2301 Totals Total Labe Task Professio Engineer/S 1548 1548	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00	90.00 Total sport Modeling Rate 185.00 185.00	720.00 19,627.50 this Task ————————————————————————————————————	
2301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00	90.00 Total of the sport Modeling Rate 185.00 185.00 185.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00	
Z301 Totals Total Labe Task Professio Engineer/S 1548 1548 1548 1548	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00	90.00 Total sport Modeling Rate 185.00 185.00	720.00 19,627.50 this Task ————————————————————————————————————	
Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00	90.00 Total seport Modeling Rate 185.00 185.00 185.00 185.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00	
Z301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Scientist II Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00	90.00 Total of the sport Modeling Rate 185.00 185.00 185.00 185.00 185.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00	
Z301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 4.00	90.00 Total 1 sport Modeling Rate 185.00 185.00 185.00 185.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00	
Z301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219 2219 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/3/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 4.00 1.00	90.00 Total 1 sport Modeling Rate 185.00 185.00 185.00 185.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00	
2301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219 2219 2219 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/3/2012 3/10/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 1.00 1.00	90.00 Total 1 sport Modeling Rate 185.00 185.00 185.00 185.00 164.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00 164.00	
2301 Totals Total Labo Task Professio Engineer/\$ 1548 1548 1548 1548 Engineer/\$ 2219 2219 2219 2219 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Roni Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/10/2012 3/10/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 1.00 1.00 7.50	90.00 Total 1 Sport Modeling Rate 185.00 185.00 185.00 185.00 164.00 164.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00 164.00 1,230.00	
2301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219 2219 2219 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/3/2012 3/10/2012	8.00 144.50 t Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 1.00 1.00	90.00 Total 1 sport Modeling Rate 185.00 185.00 185.00 185.00 164.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00 164.00	
2301 Totals Total Labo Task Professio Engineer/\$ 1548 1548 1548 1548 Engineer/\$ 2219 2219 2219 2219 2219 2219 2219	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012	8.00 144.50 T Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 1.00 1.00 7.50 5.00	90.00 Total 1 Sport Modeling Rate 185.00 185.00 185.00 164.00 164.00 164.00 164.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00 164.00 1,230.00 820.00	
2301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219 2219 2219 2219 2219 2219 2219 221	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012	8.00 144.50 T Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 1.00 7.50 5.00 4.00	90.00 Total 1 sport Modeling Rate 185.00 185.00 185.00 164.00 164.00 164.00 164.00 164.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00 164.00 1,230.00 820.00 656.00	
2301 Totals Total Labo Task Professio Engineer/S 1548 1548 1548 1548 Engineer/S 2219 2219 2219 2219 2219 2219 2219 221	Manian, Dinesh or 07 nal Personnel Scientist III Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Canizares, Rafael Mathew, Rooni	3/31/2012 LPR/NB Contaiminan 3/17/2012 3/24/2012 3/24/2012 3/31/2012 3/3/2012 3/3/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012 3/10/2012	8.00 144.50 T Fate and Trans Hours 8.00 2.00 4.00 1.00 1.00 4.00 1.00 7.50 5.00 4.00 2.00	90.00 Total 1 sport Modeling Rate 185.00 185.00 185.00 164.00 164.00 164.00 164.00 164.00 164.00 164.00 164.00 164.00	720.00 19,627.50 this Task Amount 1,480.00 370.00 740.00 185.00 164.00 656.00 164.00 164.00 1,230.00 820.00 656.00 328.00	
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2219 Totals Total Lab	Mathew, Rooni	3/31/2012	2.00 75.50	164.00	328.00 12,697.00	12,697.00
				Total th	nis Task	\$12,697.00
Task	10	Computer Support				
Professio	nal Personnel					
			Hours	Rate	Amount	
Engineer/:	Scientist II					
2219	Mathew, Rooni	3/3/2012	3.00	164.00	492.00	
2219	Mathew, Rooni	3/17/2012	1.00	164.00	164.00	
2219	Mathew, Rooni	3/17/2012	1.00	164.00	164.00	
2219	Mathew, Rooni	3/17/2012	1.00	164.00	164.00	
Totals			6.00		984.00	
Total Lab	or					984.00
				Total th	nis Task	\$984.00
				Total this	s Phase	\$79,693.50
				Total this	Project	\$85,681.50
				Total this	Report	\$85,681.50





Detailed Description of work done by M&N personnel associated to the LPR/NB Modeling Program Task Order Memoranda 4 - Scope of Work for the period 02/26/2012 to 03/31/2012 M&N Project No. 6664

Hydrodynamics Principal Investigator - Rafael Cañizares.

Task 8 – Developing	Review TOM5 SOW and Budget
LPR/NB Modeling TOM	Prepare final TOM5 SOW and Budget
SOW, Schedule and Budget	

Rooni Mathew

Task 8 – Developing	Review TOM5 SOW and Budget
LPR/NB Modeling TOM	-
SOW, Schedule and Budget	

Detailed Description of work done by M&N personnel associated to the Additional Tasks of the LPR/NB Modeling Program A for the period 02/26/2012 to 03/31/2012 M&N Project No. 6664

Hydrodynamics Principal Investigator - Rafael Cañizares.

Task 12 – HD modeling of	Review development of historical bathymetries
RM 10.9	Prepare ArcGIS files from digitized depths and charts
	Prepare difference maps (1932-2011)

Dinesh Manian

Task 12 – HD modeling of	Analysis of historical bathymetry at RM 10.9
RM 10.9	Development of surfaces, cross sectional plots and prepare figures with historical profiles



Detailed Description of work done by M&N personnel associated to the LPR/NB Modeling Program Task Order Memoranda 5 - Scope of Work for the period 02/26/2012 to 03/31/2012 M&N Project No. 6664

Hydrodynamics Principal Investigator - Rafael Cañizares.

Task 1 – Project	Internal coordination with Deltares and M&N
Management	Calls and Coordination with Project Coordinator including
	prepare material such as Dash Board reports.
	Prepare and review invoices
	Modeling update call, coordination and attendance
	Attend TC meeting and prepare modeling update presentation
	Collaboration meeting with EPA, preparation and attendance
Task 2 – Data Analysis &	Historical Bathymetric data review, QA/QC.
Monitoring Design	Remediation module development.
Coordination for Use in	Discussion with CH2mhill. Prepare information to generate
Numerical Model	the remediation module files.
Task 3 – System	Review of inputs for remediation module
Understanding	Review NB data, NB System Understanding
	NB System understanding discussion with Han Winterwerp
	Coordination with Han Winterwerp, Bathymetry analysis
Task 4 – LPR/NB	Internal coordination and discussion, wave model
Hydrodynamic Model	MSC meeting Preparation and attendance
Task 5 – LPR/NB Sediment	Discussion with Han Winterwerp on sediment transport
Transport Modeling	modeling and next tasks
	Internal coordination
Task 7 – LPR/NB	Coordination and discussions with Leo Postma and Rooni
Contaminant Fate and	Mathew
Transport Modeling	Review of Remediation module
	Prepare presentation of remedial module

Rooni Mathew.

Task 2 – Data Analysis	Debug wetting and drying code for travel time runs, review
	model results
	Review Spring and Fall PWCM salinity data at RM 10.2
	Sediment grain size distribution (GSD) data extraction and
	send to EPA for mutual review for convergence
	Review CARP and LPR MWP documents for Hg
	partitioning/speciation, and summarize travel time analysis
	for Kristen Durocher
	Review QAPP and develop Tidal 1 & 2 locations for CWCM

Lower Passaic River Restoration Modeling Program M&N Project No. 6664



	Event 3
Task 3 – System	Develop COPC core profile plots for LPR and NB
Understanding	Review NB source tracking runs
Chucistanuing	S
Task 5 – LPR/NB	Review NB wave analysis
	Call with HQI to discuss remediation codes, collaboration
Sediment Transport	follow-up, ST model inputs convergence
Modeling	Debug wetting and drying in <i>advsed.for</i> for external mode hydro, redo benchmark runs, develop inputs for Hurricane
	Irene
	Develop inputs for Hurricane Irene, review post-dredge infill runs
	Develop RI/FS work summary for MSC call, model-data comparisons for Pilot Dredging study
	Develop open and freshwater SSC BC for Jun 2010 to Oct 2011 run
	Discuss w HQI remediation in HQI runs w ECOM-SEDZLJS MSC call
	Develop NB GSD map, develop LPR/NB GSD spatial w
	in/out navigation channel distinction
	Recalculate bed elevation changes for Irene w realistic bulk density
	Report code bugs to HQI, process 2010-2011 SEDZLJS run
	Review benthic data for locations in inter-tidal zone
	Review NB wind-wave analysis, Spring PWCM data
	analysis, review model-data comparisons for bed elevation
	change in 2010-2011
	Attend collaboration meeting
	Attend MSC meeting
	Develop ST modeling presentation. for collaboration/MSC
	meetings
	Follow-up from collaboration meetings, launch runs w consol core for Irene
	Code changes for decoupled ST run w bathy feedback via
	continuity correction, debug and run
	Develop options for bathy feedback w hydrodynamics,
	review predictions 2010-2011 bathy changes from run w
	consol core
	Review predictions 2010-2011 bathy changes from run w
	consol core, review bed accumulation from base run for test
	on bathy feedback, develop coupled run w bathy feedback,
	develop decoupled run w bathy feedback with continuity
	correction discuss & send PWCM data and analysis to Pravi Shrestha
Task 7 – LPR/NB	
Contaminate Fate and	Call with Integral/AQEA/CH2MH to discuss remediation inputs, codes, etc
Transport Modeling	
Transport Modeling	Develop box model for CFT long-term test runs

Lower Passaic River Restoration Modeling Program M&N Project No. 6664



	Review core profile plots and incorporation into Google
	Earth, send to Deltares
	Develop RI/FS work summary for MSC call
	Discuss w HQI remediation in HQI runs w ST-SWEM and
	RCATOX. Review ST-SWEM for HQI particle mixing
	calculations.
	Implement HQI particle mixing calculations into CPG OC
	simplification, launch baseline RCA run for Hg and
	2378TCDD
	MSC call, review ST-SWEM for HQI calculations. of particle
	mixing
	Debug projection run, review long-term sediment COPC
	decline
	Develop inputs and long-term run for PCB-77, develop
	scripts for projection runs
	Follow-up HQI particle mixing question, review runs w HQI
	bioturbation rate,
	Review runs w HQI bioturbation rate, review/discuss
	RCATOX remediation routines w RC
	Attend collaboration meeting
	<u>-</u>
	Attend MSC meeting
	Develop CFT modeling presentation for collaboration/MSC
	meetings
	Follow-up from collaboration meetings, launch additional
	runs with HQI mixing rates
	Review 1966 bathy errors with Rafael Canizares
Task 10 – Computer	Debug hardware issue with 3 new machines, reseed
Support	processors
	Debug OS installation issues with new machines
	Debug stability issues
	Install OS on new machines

Dinesh Manian

Task 2 – Data Analysis & Monitoring Design Coordination for Use in Numerical Model	Tracer simulations to predict travel-time from Dundee-Dam by advection/dispersion for release at different times during tide, spring/neap, and different discharges
Task 3 – System Understanding	Aggregating contaminant core profiles from multiple historical datasets in NB and LPR together with overall contaminant data analysis in OpenEarth. Analysis of wind data and wave model predictions in Newark Bay to estimate potential impact on sediment transport Newark Bay system understanding: Creating a wave frequency-distribution for Newark Bay based on 15 year

Lower Passaic River Restoration Modeling Program M&N Project No. 6664



	wind forcing from model results of SWAN
	wind forcing, from model results of SWAN NB system understanding: 15 year wave statistics at every model grid-cell based on synthetic SWAN model simulations Extracting the spatial movement of ETM along the river from the long term model simulations with and without NB dredge to understand effect of historical bathy changes on salt-water penetration. Newark Bay wave shear stress computation using Swart formulation. Building 16 year shear stress time-series. Understanding flux balance in Newark Bay through analysis of model results Analysis of corrected 1966 bathy - comparison with Cs peak, comparison with other historical bathymetries at contaminant core locations Recompute wave stress statistics in Newark Bay using Soulsby's formulation for smooth flows. Reincorporating the corrected 1966 bathymetry in the contaminant groupings analysis of the lower miles of the river.
Task 5 – LPR/NB Sediment Transport Modeling	Long term morphology run with 1940s post-dredge bathymetry in Newark Bay as well as the LPR; Setting up SedTran boundary conditions for Hurricane Irene (WY2010-2011) simulation Newark Bay understanding: Series of sediment transport runs to understand sediment fluxes in Newark Bay by tracking sediments from different reaches of the Bay. Processing long-term morphology simulations with post-dredge bathymetry in the lower Passaic and NB. Analysis of model results, putting together model results from long term sedTran simulations for MSC presentation MSC meeting Setting up sediment-transport projection run for additional 15 years with recycled hydrodynamics; Processing long term morphology runs for ETM analysis;

Yi Xiong

Task 2 – Data Analysis	Continue with code corrections and additional data analysis Correct the code and regenerate the data files; Interpolate PCB105. Generate the processed data sets for the rest of PCBs.
	Revisit the data analysis folder for PCB-77; Get the help to fix the MATLAB problem; Do the data analysis for PCB-105. Do the interpolations for the rest 6 PCBs.

Work Detail Invoice period 02/26/2012 to 03/31/2012 - TOM4 & TOM5 June 4, 2012 Page 6 of 6



For the 6 PCBs: 1. Clip the interpolated points with the outside of equivalent navigation channel; 2. Spatial Join the clipped interpolated points with grid cells to get the averaged concentration; 3. Put the generated outside channel concentration into PRN files.

Run the program to generate PCBs concentration for each cell; Generate the EXCEL files with all the initial condition data; Generate and adjust PCBs PDF distribution figures.

Update input files for all 6 PCBs; Look at the PCBs distribution figures.

Work on initial conditions for 6 PCBs (PCB-77,81,105,114,118,123): 1. Complete 25' interpolations for left and right sides for each layer and each PCB; 2. Complete the transfer of raster to point; Combine the left and right

interpolated points using MERGE